Electronic Hotel Card LocksThese are wonderful little microcomputer projects masquerading as door locks. Inside there's a processor running a program, with I/Oleads going to things like the magnetic strip reader, or the infrared LEDs, and the solenoid, and the lights on the outside. They arepowered entirely by a battery pack, and the circuitry is designed such that it draws almost nil power while idle. The cards are usuallymagnetic-strip or infrared. The former uses an oxide strip like a bank card, while the infrared card has a lot of holes punched in it. SinceIR light passes through most kinds of paper, there is usually a thin layer of aluminum inside these cards. The nice thing about thesesystems is that the cards are generally expendable; the guest doesn't have to return them or worry about lost-key charges, the hotel canmake them in quantity on the fly, and the combination changes for each new guest in a given room. The hotel therefore doesn't need afulltime key shop, just a large supply of blank cards. Duplication isn't a problem either since the keys are invalidated so quickly.The controlling program basically reads your card, validates the number it contains against some memory, and optionally pulls asolenoid inside the lock mechanism allowing you to enter. The neat thing about them is that card changes are done automatically and unknowingly by the new incoming guest. The processor generates new card numbers using a pseudorandom sequence, so it is able toknow the current valid combination, and the *next* one. A newly registered guest is given the *new* card, and when the lock sees thatcard instead of the current [i.e. old guest's] card, it chucks the current combination, moves the next one into the current one, andgenerates the new next. In addition there is a housekeeping combination that is common to all the locks on what's usually a floor, orother management-defined unit.There is no wire or radio connection to the hotel desk. The desk and the lock are kept in sync by the assumption that the lock won'tever see the "next" card until a new guest shows up. However if you go to the desk and claim to have lost your card, the new one theygive you is often the "next" card instead. If you never use it and continue using your old card, the guest after you will have the wrong"next". In cases like this when the hotel's computer and the lock get out of sync, the management has to go up and reset the lock. Thisis probably done with a magic card that the lock always knows about [like in ROM], and tells it something akin to "use this next card I'mgoing to insert as the current combination". The pseudorandom sequence simply resumes from there and everything's fixed. If the lockloses power for some reason, its current memory will be lost but the magic "reset" card will work.Rumor has it that these locks always have a back-door means of defeating them, in case the logic fails. Needless to say, a givenmanufacturer's method is highly proprietary information. In theory the security of these things is very high against a "random guess"card since there are usually many bits involved in the combination, and of course there is no mechanical lock to be manipulated orpicked. The robustness of the locking hardware itself sometimes leaves something to be desired, but of course a lock designed for a hoteldoor probably isn't the kind of thing you'd mount on your house.